IN THE CLAIMS:

Please change claims: 1, 6, 9, 11, 15, 16, 18 through 22, 25, and 34 through 40 — all to read as follows.

1. (currently amended) Apparatus for printing a desired image on a printing medium, based upon input image data, by construction from individual marks of at least one colorant, formed in a pixel grid; said apparatus comprising:

for each colorant, at least one respective multielement printing array that is subject to mark-intensity errors of individual printing elements, including variations in printed intensity as among said elements of the array;

means for measuring mark-intensity errors of the at least one array;

means for modifying, without entirely replacing, a preexisting multicolumn, multirow numerical tabulation that defines an intensity correspondence between such input image data and such marks, to compensate for the measured mark-intensity errors;

said modifying means and said modified tabulation comprising means for controlling a halftoning stage or other rendition stage of the printing apparatus;

wherein said modifying means comprise means for introducing continuous control enabling compensation that is different for different print densities;

wherein said halftoning or other rendition stage, prior to final printing preparations and in response to said measuring, enable precise reduction of said intensity variations as among said elements; and

means for printing using the modified tabulation.

2. (previously presented) The apparatus of claim 1, wherein:

the apparatus has printing resolution on the order of 450 marks per inch; and

the apparatus has mark-positioning addressability on the order of 450 marks per inch, or less.

3. (previously presented) The apparatus of claim 2, wherein:

the optical-density transformation comprises a rendition-thresholding dither matrix.

4. (previously presented) The apparatus of claim 2, wherein:

the optical-density transformation comprises an error-diffusion thresholding hierarchy.

5. (previously presented) The apparatus of claim 2, wherein:

the number of individual marking elements in use, divided by the number of rows in the tabulation, equals an integer;

the tabulation is one- or two-dimensional only;

for at least one of the plurality of multielement printing arrays, the mark-intensity error comprises a respective pattern of printing-intensity defects;

the measuring means comprise means for measuring the pattern of mark-intensity defects for each multielement printing array respectively; and

the modifying means comprising means for applying the respective pattern of defects, for at least one of the multielement printing arrays, to modify a respective said tabulation.

6. (currently amended) The apparatus of claim 1, wherein:

the means for introducing continuous control, enabling precise reduction of variations, comprise means for applying negative feedback based upon measured intensity variations

~~for at least one of the plurality of multielement printing arrays, the colorant-deposition error comprises a swath-height error; the measuring means comprise means for measuring mark-intensity error for one or more groups of printing elements, each group being fewer than all the elements, of each multielement printing array respectively; and the modifying means comprise means for applying the respective mark-intensity error, for at least one of the multielement printing arrays, to modify a respective said tabulation.~~

7. (previously presented) The apparatus of claim 1, wherein:

the mark-intensity error comprises a pattern of printing-density defects;

the measuring means comprise means for measuring the pattern of printing-density defects;

the modifying means comprise:

means for deriving a correction pattern from the measured pattern of printing-density defects, and

means for applying the correction pattern to modify a halftone thresholding process; and

for each colorant, the printing means comprise means for printing such image incrementally, using the modified halftone thresholding process.

8. (previously presented) The apparatus of claim 1, wherein:

the measuring means comprise means for measuring mark-intensity error for individual printing elements, individually, of at least one of the multielement printing arrays, respectively; and

the modifying means comprise:

means for deriving a correction pattern from the measured mark-intensity error, and

means for applying the correction pattern to modify the tabulation.

9. (currently amended) A method of printing a desired image, by construction from individual marks of at least one colorant, formed in a pixel grid by at least one multielement printing array that is subject to a pattern of printing-density defects, including error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array; said method comprising the steps of:

measuring mark-intensity error;

deriving a correction pattern from the measured pattern of printing-density defects, including error in intensity;

applying the intensity-error correction pattern to correct the error, by modifying a halftone thresholding process that uses a halftoning matrix which is a predefined numerical tabulation ~~array~~;

wherein the applying step comprises preparing a modified form of the predefined numerical tabulation ~~array~~, based upon the intensity-error correction pattern, and then using that modified form of the tabulation ~~array~~;

said applying and preparing steps, and said modified form of the numerical tabulation, being used to control the halftoning matrix;

wherein said applying and preparing steps further comprise introducing continuous control, enabling compensation that is different for different print densities;

wherein said continuous control, in response to said measuring, enables precise reduction of said intensity variations as among said elements; and

for each said colorant, printing such image by said at least one multielement array respectively, using the halftone thresholding process modified on the basis of the intensity-error correction pattern.

10. (previously presented) The method of claim 9, for use with a printmask in plural-pass printing, said printmask being a defined system of numerical values, distinct from the measured pattern of defects and distinct from the derived correction pattern, that establishes the printing pass in which each ink mark is to be made; and further comprising the steps of, before or as a part of the applying step:

using such printmask to determine a relationship between the halftone matrix and the multielement array; and

employing the relationship in the applying step to control application of the correction pattern to the halftone matrix.

11. (currently amended) The method of claim 9, wherein:

the printing step comprises cooperation between plural printing elements that mark in a single common color, to form marks that together define a single common small region of such image [[.]] in said common color.

12. (previously presented) The method of claim 9, wherein:

the method comprises no positional-error feedback to modify positional addressing of image data in relation to the pixel grid.

13. (original) The method of claim 9, for use with said at least one multielement incremental-printing array that comprises a plurality of multielement printing arrays that print in a corresponding plurality of different colors or color dilutions, each multielement printing array being subject to a respective pattern of printing-density defects; and wherein:

the measuring, deriving, applying and printing steps are each performed with respect to each multielement printing array respectively.

14. (original) The method of claim 13, for use with such plurality of multielement incremental-printing arrays that are also each subject to a respective swath-height error; and wherein:

the measuring, deriving, applying and printing steps are also employed to modify swath height of at least one of the multielement printing arrays, for accommodating any swath-height error present in each multielement printing array respectively.

15. (currently amended) The apparatus ~~method~~ of claim 1 [[9]], wherein:

the halftoning or other rendition stage ~~thresholding process~~ comprises means defining ~~tion of~~ a halftone matrix.

16. (currently amended) The apparatus ~~method~~ of claim 1 [[9]], wherein:

the halftoning or other rendition stage ~~thresholding process~~ comprises means defining an error-diffusion protocol.

17. (original) The method of claim 16, wherein the error-diffusion protocol comprises at least one of:

a progressive error-distribution allocation protocol of such error-diffusion halftoning; and

a decisional protocol for determining whether to mark a particular pixel.

18. (currently amended) The apparatus ~~method~~ of claim 1 [[9]], wherein:

the halftoning or other rendition stage ~~applying step~~ comprises means for replacing error diffusion or halftoning threshold values above or below a particular value.

19. (currently amended) The apparatus ~~method~~ of claim 1 [[9]], wherein:

the halftoning or other rendition stage ~~applying step~~ comprises means for multiplying error diffusion or halftoning threshold values by a linear factor.

20. (currently amended) The apparatus ~~method~~ of claim 1 [[9]], wherein:

the halftoning or other rendition stage ~~applying step~~ comprises means for applying a gamma correction function to error diffusion or halftoning threshold values.

21. (currently amended) The apparatus ~~method~~ of claim 1 [[9]], wherein:

the halftoning or other rendition stage ~~modifying step~~ comprises a combination of at least two of:

means for replacing error diffusion or halftoning threshold values above or below a particular value;

means for multiplying each error diffusion or halftoning threshold value by a linear factor; and

means for applying a gamma correction function to error diffusion or halftoning threshold values.

22. (currently amended) The method of claim 9, wherein:

the continuous control comprises application of negative feedback to make the uniformity of marking intensity relatively precise as among the individual marking elements

~~for each of the plurality of multielement arrays, the measuring, deriving and applying steps are each performed at most only one time for a full image.~~

23. (currently amended) The method of claim 9, wherein:

the printing elements have a spacing along the array; and

the printing step proceeds with a positioning precision and addressability that <u>are</u> [[is]] coarser than or equal to said printing-element spacing along the array.

24. (previously presented) The method of claim 9, wherein:

the applying step comprises modifying the average number of marks printed by an individual printing element whose mark intensity is defective.

25. (currently amended) A method of operating a printing apparatus to print a desired image, based on input image data, by construction from individual marks of at least one colorant, formed in a pixel grid by at least one scanning multielement printing array; said printing being subject to error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array; said method comprising the steps of:

measuring mark-intensity error;

based on the measured mark-intensity error, compensating for the intensity error without modifying position of particular marks relative to such pixel grid, or to any ideal form of such pixel grid;

said compensating step comprising control of a halftoning stage or other rendition stage of the printing apparatus;

wherein compensating corrections in said halftoning or other rendition stage prior to final printing preparations, as negative feedback in response to said measuring, enable precise reduction of said intensity variations as among said elements.

26. (previously presented) The method of claim 25, wherein:

said scanning multielement printing arrays are at least two in number;

each printing array forms a pixel grid that is at least partially different from a pixel grid formed by each other printing array, and from any ideal form of such pixel grid; and

aside from linear alignment, no step of the method is directed to regularizing the pixel grids to one another or to such ideal form.

27. (previously presented) The method of claim 25, wherein:

the compensating step comprises the step of adjusting thresholds of a preexisting tabulation that forms a relationship between said input image data and the individual printed marks,

said threshold-adjusting step statistically increases or reduces usage of printing elements associated with said mark-intensity error, thereby increasing or decreasing total numbers of marks in image regions associated with those printing elements.

28. (previously presented) The method of claim 25, wherein:

the measuring step comprises measuring mark-intensity error of printing elements considered as groups, said groups being fewer than all the printing elements for any given color.

29 through 33. (canceled)

34. (currently amended) Apparatus for printing a desired image on a printing medium, based upon input image data, by construction from individual marks formed in a pixel grid; said apparatus comprising:

at least one multielement incremental-printing array that is subject to colorant-deposition error, including error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array;

means for measuring mark-intensity error of the at least one array;

means for modifying a multicolumn, multirow numerical tabulation, which forms an intensity relationship between such input image data and such marks, to compensate for the measured mark-intensity error; and

means for printing using the modified tabulation;

wherein the multielement printing array is an inkjet printhead;

said modifying means and said modified tabulation comprising means for controlling a halftoning stage or other rendition stage of the printing apparatus;

wherein said modifying means comprise means for introducing continuous control enabling compensation that is different for different print densities;

wherein said halftoning or other rendition stage, prior to final printing preparations and in response to said measuring, enable precise reduction of said intensity variations as among said elements.

35. (currently amended) A method of printing a desired image, by construction from individual marks formed in a pixel grid by at least one multielement printing array that is subject to a pattern of printing-density defects, including error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array; said method comprising the steps of:

measuring error in mark intensity;

deriving a correction pattern from the measured mark-intensity error;

applying the correction pattern to modify a halftone thresholding process that uses a halftoning matrix which is a predefined numerical tabulation ~~array~~;

wherein compensating corrections, in said halftone thresholding process prior to final printing preparations, introduce continuous control enabling compensation that is different for different print densities and thereby enabling precise reduction of said intensity variations as among said elements;

wherein the applying step comprises preparing a modified form of the predefined numerical tabulation ~~array~~, and then using that modified form of the tabulation ~~array~~, to correct the error in mark intensity; and

printing such image using the modified halftone thresholding process;

wherein the multielement printing array is an inkjet printhead.

36. (currently amended) A method of printing a desired image, based on input image data, by construction from individual marks formed in a pixel grid by at least one scanning multielement printing array; said printing being subject to print-quality defects due to departure of printing-medium advance from an optimum value~~, and also including error in mark intensity of individual printing elements, considered individually~~; said method comprising the steps of:

measuring a parameter related to such print-quality defects;

based on the measured parameter, scaling such input image data with regard to image dimension in the advance direction to compensate for said departure; and

printing such image using the scaled input image data;

wherein the multielement printing array is an inkjet printhead.

37. (currently amended) Apparatus for printing a desired image on a printing medium, based upon input image data, by construction from individual marks of at least one colorant, formed in a pixel grid; said apparatus comprising:

for each colorant, respective means for printing incrementally in that colorant;

each said printing means, for a particular one colorant, comprising at least one respective incremental-printing array that is subject to colorant-deposition error, including error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array;

means for measuring mark intensity error of the at least one array;

means for modifying a multicolumn, multirow numerical tabulation that forms an intensity relationship between such input image data and such marks, to compensate for the measured error in mark intensity;

wherein the numerical tabulation is not a halftone screen;

said modifying means and said modified tabulation being used to control a nonhalftoning rendition stage of the printing apparatus;

wherein compensating corrections in said halftoning or other rendition stage prior to final printing preparations, as negative feedback in response to said measuring, enable precise reduction of said intensity variations as among said elements; and

means for printing using the modified tabulation.

38. (currently amended) Apparatus for printing a desired image on a printing medium, based upon input image data, by construction from individual marks formed in a pixel grid; said apparatus comprising:

at least one multihundred-element printing array that is subject to colorant-deposition error, including error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array;

means for modifying a multicolumn, multirow numerical tabulation that forms an intensity relationship between such input image data and such marks, to compensate for the measured error in mark intensity;

said modifying means and said modified tabulation being used to control a halftoning stage or other rendition stage of the printing apparatus;

wherein said modifying means comprise means for introducing continuous control enabling compensation that is different for different print densities;

wherein said halftoning or other rendition stage, prior to final printing preparations and in response to said measuring, enable precise reduction of said intensity variations as among said elements; and

means for printing using the modified tabulation.

39. (currently amended) The apparatus of claim 38, wherein:

the means for introducing continuous control comprise means for applying negative feedback

~~apparatus has printing resolution on the order of 450 marks per inch; the apparatus has mark-positioning addressability on the order of 450 marks per inch, or less, along at least one axis; whereby the apparatus is incapable of hyperacuity operation; the apparatus further comprises means for measuring intensity error of the at least one array; and the multihundred-element array has at least three hundred printing elements.~~

40. (currently amended) Apparatus for printing a desired image on a printing medium, based upon input image data, by construction from individual marks formed in a pixel grid; said apparatus comprising:

at least one multielement incremental printing array, having at least thirty printing elements, that is subject to colorant-deposition error, including error in mark intensity of individual printing elements, considered individually, including variations in printed intensity as among said elements of the array;

means for measuring intensity error of the at least one array;

means for modifying a multicolumn, multirow numerical tabulation, which forms an intensity relationship between such input image data and such marks, to compensate for the measured colorant-deposition error, including error in mark intensity;

said modifying means and said modified tabulation being used to control a halftoning stage or other rendition stage of the printing apparatus;

wherein compensating corrections in said halftoning or other rendition stage prior to final printing preparations, as negative feedback in response to said measuring, enable precise reduction of said intensity variations as among said elements; and

means for printing using the modified tabulation.

41. (previously presented) The apparatus of claim 40, wherein:

the at least one multielement incremental printing array comprises a scanning printhead or a full-page-width printhead.

42. (previously presented) The apparatus of claim 40, wherein:

the printing means comprise at least one microprocessor controlling all of the at least thirty elements simultaneously during printing to select, and selectively actuate, particular elements for printing of particular pixels respectively.